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ABSTRACT

This guide to alternate formats describes the presentation of materials in forms that allow individuals with varying physical, sensory, or cognitive skills to access the information. The booklet was developed to assist vocational rehabilitation counselors in helping employers to provide workplace materials to employees with disabilities or provide information to the general public in a variety of alternate formats. After an introduction, types of formats appropriate for the following specific groups are detailed: people with low vision or blindness, people with hearing loss or deafness, and people with learning disabilities. General guidelines for producing alternate formats precedes a discussion of specific suggestions for adapting regular print documents, in regard to: contrast; paper type; type size, spacing, and typeface; and costs and resources. Discussion of large print documents focuses on ways to enlarge print, costs and resources, and formatting for scanners. Also covered in some detail is use of Braille and audio tape. The use of electronic transmission/diskettes for provision of alternative formats is addressed, as are the uses and costs of diskettes and CD-ROMs. Next, broadcast media and captioning are explained with cost information. In the section on resources, a suggested order form is provided, as are a list of large print computer programs for on-screen viewing, and a list of vendors and organizations that provide technical assistance. (Author/DB)

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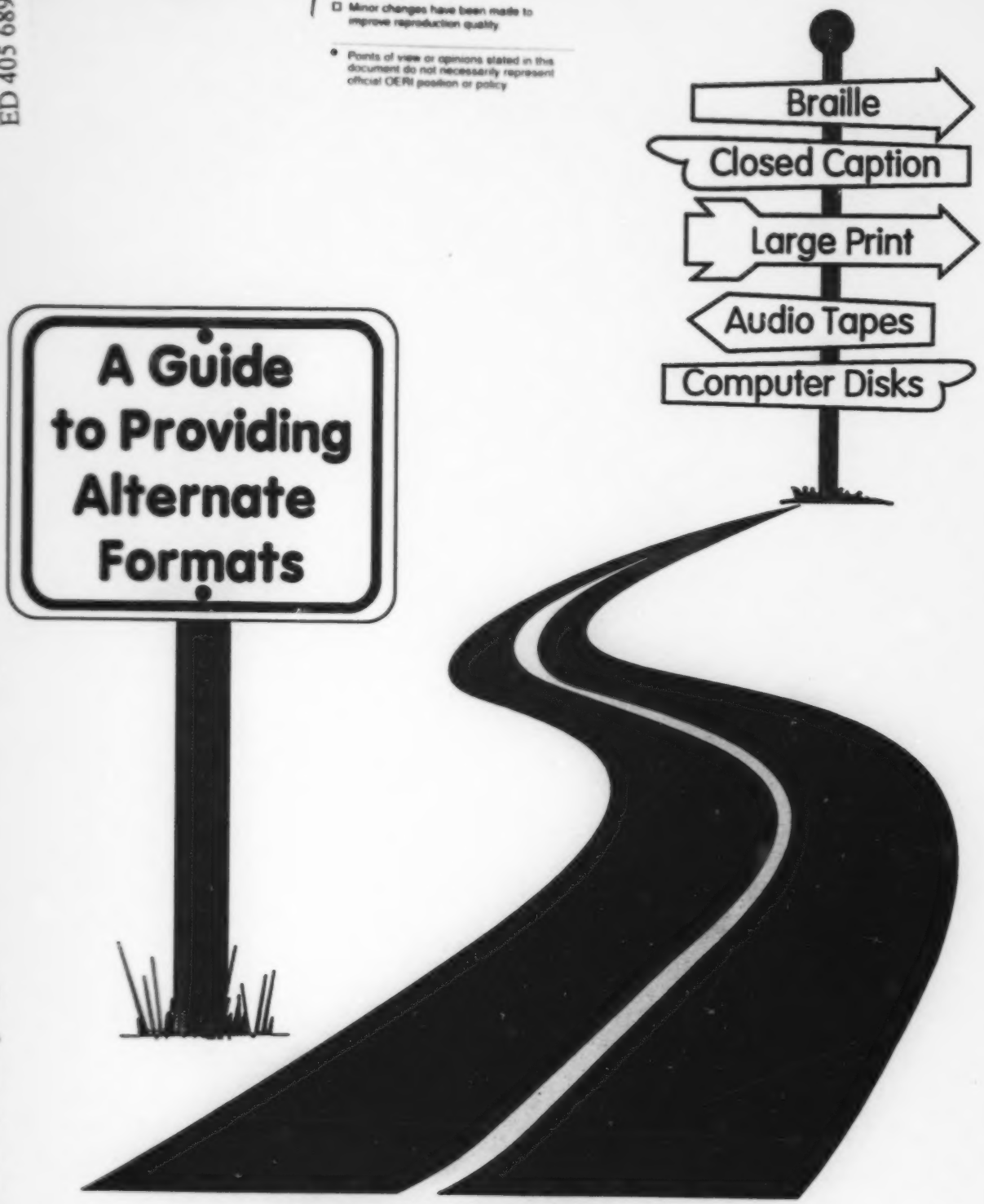

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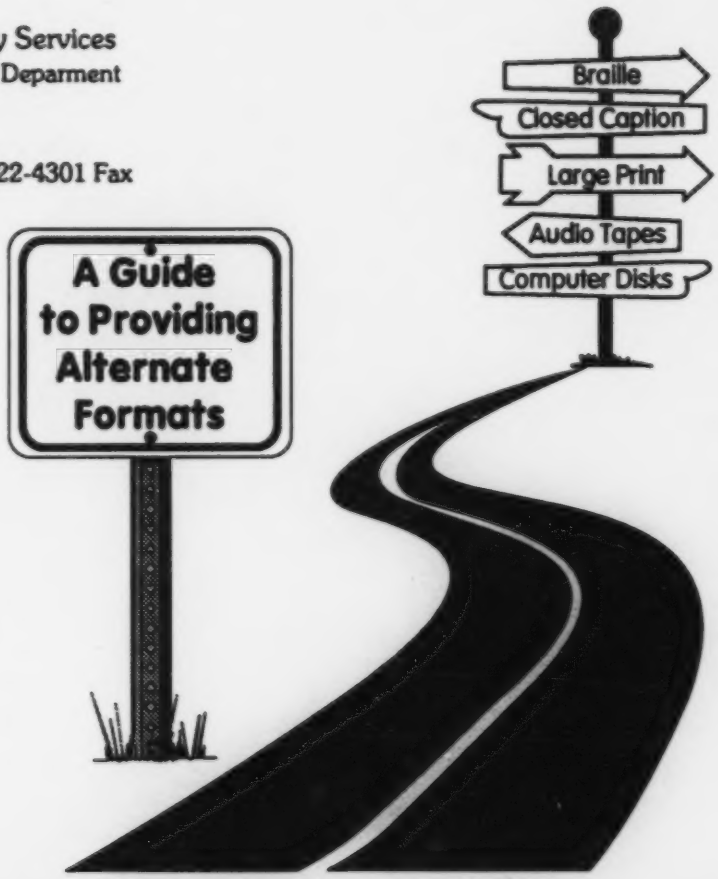


Alternate Formats

Introduction

The term "alternate formats" refers to the presentation of materials in forms that allow individuals with varying physical, sensory, or cognitive skills to access the information.

Large Print

The Americans with Disabilities Act requires that alternate formats be provided whenever it is reasonable to do so. Everyone in the work place who provides information to employees or to the general public needs to be prepared to produce materials in alternate formats.

Examples include:

- ☐ Anyone who provides information to clients, to customers, or to other consumers;
- ☐ people who prepare information for client referral;
- ☐ persons who do presentations;
- ☐ Rehabilitation engineers or technicians who need to provide operating instructions for devices in alternate formats;
- ☐ Therapists who need to provide stimulus materials or self-care instructions in alternate formats; and
- ☐ Vocational evaluators who need to provide testing materials in alternate formats.

Braille

There are many groups which may be able to benefit from material that is presented in alternate formats. These groups may include people with low vision or blindness; persons with hearing loss or deafness; and persons with learning disabilities. These persons and others may be accommodated by clear, legible, and adaptable materials provided in regular print format; large print documents may be preferred by some. Many persons with limited vision may require materials in Braille; audio tapes are often a preferred format. Materials that are saved on a computer diskette may be retrieved in a number of different formats; this is perhaps the most versatile of the alternate formats. It may be advisable to consult with potential users to ascertain what technology they have available so that your formats may be tailored to their needs.

For example, if a user has a computer and large type software, it may not be necessary for you to provide a large print copy of your material; a diskette may suffice.

Preparing documents in alternate formats permits dissemination of information to a variety of persons who require accommodations. However, other measures are required to adapt presentations to a variety of participants. Videotaped presentations may require captioning; oral presentations may be enhanced in many ways to accommodate individuals with disabilities.

This booklet was developed in an attempt to assist in the preparation of alternate formats. The material was compiled from other sources by Center for Rehabilitation Technology Services staff since it is felt that it would be helpful to have all of this information in a single reference.

A resource listing appears at the end of this document. This listing provides names, addresses, and telephone numbers of vendors and organizations that may be able to provide technical assistance in the provision of alternate formats.

Groups that may have alternate format needs

LOW VISION OR BLINDNESS

An individual is considered legally blind if his or her vision is 20/200 in both eyes with best correction. The definition of legal blindness also includes individuals whose central vision is reduced to 20 degrees or less. Low vision, or visual impairment, refers to individuals whose vision falls between 20/70 and 20/200 with best correction. According to *Lighthouse News* (1991), deficits associated with low vision that may make reading difficult include dimming or blurring of the image, and visual field loss.

Some people are born blind or lose vision early in life. For others, reduced vision may come later in life. The U.S. Public Health Service indicates that two out of three older Americans have poor vision; that the majority of older Americans rate low vision as their number one health problem; and that limited vision is cited as the third most frequent health condition restricting daily activities for persons over the age of 65. For some, alternative formats may provide a bridge in accessing information that they would otherwise be denied.

Commonly used equipment for individuals with low vision includes:

- ☐ magnifiers;
- ☐ closed circuit television (CCTV);
- ☐ large print software for computers;
- ☐ illumination controlling devices (magnification lamps, color filters, sunglasses, etc.); and
- ☐ scanners (Optical Character Recognition, or OCR).

HEARING LOSS OR DEAFNESS

According to Info-Line (April 1992, p. 11), approximately 8 to 10 percent of the population may have some kind of hearing loss. A person is considered to be deaf if he/she is unable to hear any sound. If a person with a hearing loss hears any sound with or without a hearing aid, he/she is considered hard of hearing. The term "hearing impaired" refers to both of these groups. As with blindness, some people are congenitally hearing impaired and others experience hearing loss later in life. The U.S. Senate Special Committee on aging has estimated that poor hearing is the third most frequent chronic condition in late life. Approximately one out of every seven people over the age of 45 has a hearing impairment, increasing to one in four over the age of 65. Thirteen percent of people over age 65 show advanced signs of hearing loss, and are 13 times as likely to wear a hearing aid.

If an individual hears well enough or is able to read lips, accommodation may consist of providing front-row seating. If positioning within the room is an inadequate accommodation, it may be necessary to provide an audio loop listening device, a wireless frequency modulated listening system, a note-taker, or an interpreter for the individual.

LEARNING DISABILITIES

Info-line (April, 1992) states that between 10 and 15 percent of the population with normal or above average intelligence may be learning disabled to the extent that normal life functions are somewhat impaired. Persons with learning disabilities are evenly distributed throughout the population, and their intelligence, educational levels, responsibilities, and successes mirror those who are not learning disabled.

Learning disabilities may be evident in the following areas:

- ☐ **Visual:** An inability to create meaning from written material
- ☐ **Auditory:** An inability to combine sounds into meaningful words
- ☐ **Muscular:** Failure to properly use fine or gross motor skills
- ☐ **Processing:** Inability to process and store information in short-term memory
- ☐ **Attention:** Decreased attention span

Persons with learning disabilities may be able to benefit from the services of a note-taker; they may also find audio tapes to be helpful.

How to produce alternate formats

When preparing materials for any format:

- ☐ Use simple, clear, commonly used words, eliminating any unnecessary words.
- ☐ When technical terms must be used, they should be clearly defined.
- ☐ Compound complex sentences should be broken down into several short sentences, stating the most important ideas first.
- ☐ Introduce one idea, fact, or process at a time; then develop the ideas logically.
- ☐ All noun-pronoun relationships should be made clear.
- ☐ When time and setting are important to the sentence, place them at the beginning of the sentence.
- ☐ When presenting instructions, sequence steps in the exact order of occurrence.
- ☐ If processes are being described, they should be simply illustrated, labelled, and placed close to the text they support.

Publishing materials using the following alternate formats may make them accessible to individuals with varying physical, sensory, or cognitive skills.

Regular Print Documents

CONTRAST

When producing regular print documents, contrast, aesthetics, print quality, and cost are all factors that should be considered.

Contrast is the degree of separation of tones in print from the background paper. For partially sighted readers, high contrast is critical to legibility. Very high contrasts are difficult to achieve with color combinations other than black and white; text should always be printed with the highest possible contrast.

For many partially sighted readers, light (white or light yellow) letters on a dark (black) background are more readable than dark letters on a white background. Since color compromises high contrast, both colored print and paper should be reserved for titles and special effects (e.g., covers, headlines, titles).

There are some cost considerations, even when regular print is the format of choice. High contrast, especially white writing on a black background, may be more expensive to produce. More print toner is required; many printers do not have the capability to produce reversed print; and not all software allows reverse printing. Additionally, white paper is less costly than colored paper or colored print.

However, producing high contrast documents should require no additional resources if your printer and software support high contrast printing. Information on high contrast is available in software and printer manuals, as well as from your local print shop or copy center.

PAPER TYPE

The finish on paper can range from a dull or matte finish to high gloss. A matte finish is most often used for general documents; glossy paper is usually used for leaflets, brochures, etc. Paper with a matte finish is best to enhance maximum legibility for partially sighted individuals. Glossy paper produces glare and can lessen legibility for partially sighted people. If a more "flashy" document is desired, the classy look of glossy paper can be achieved with distinctive colors and graphics. Although colors do not yield the high contrast of black and white, colors on matte paper are much easier to read than any glossy document. In terms of cost, good quality glossy paper is often expensive, and usually more expensive than good quality matte paper. Therefore, avoiding glossy paper is one way to minimize expense.

Many suppliers have wholesale catalogues with samples of different papers they carry. Office supply stores with showrooms have paper samples on display. Local print shops or printing companies will often arrange tours of their shops where paper samples may be viewed, and often paper swatches are provided to potential customers.

A sample of Foundry type, which is made from cast metal.

TYPE SIZE, SPACING, AND TYPEFACE

Because the earliest type consisted of solid blocks of wood or metal ("the body") upon which the area to be printed ("the face") was carved or punched, all measurements historically relate to these three-dimensional objects.

The different ways of measuring print characters and spacings are important in regulating what the text will look like on the printed page, and how the text looks on a page can dramatically affect legibility and the ability to transform the printed text into another usable format.

The standard unit of type size is the point.

- A point measures about 72 to the inch, which means that an inch can be divided into 72 points.
- A point size of 72 would indicate 1" tall letters.
- Point size varies somewhat with different typefaces.
- The point sizes most often used are 10 and 12 point for documents to be read by persons with excellent vision reading in good light.
- Ten or 12 point type is approximately one-eighth of an inch high.

72

72 points = 1 inch

Font and typeface selection can affect legibility of documents.

A font is a complete assembly of all the characters in a single typeface. Including uppercase and lowercase letters, numerals, and punctuation marks.

- ❒ (upper and lower case letters, numerals, etc.)of one size of one typeface (e.g., 10-point Soutane, **12-point Futerist Condensed**).
- ❒ There are several thousand fonts available today with printers varying in how many fonts they support.
- ❒ Typeface refers to the range of designs that are all variations of one basic style of alphabet (e.g.,Soutane, *italic*, **bold**, etc.).

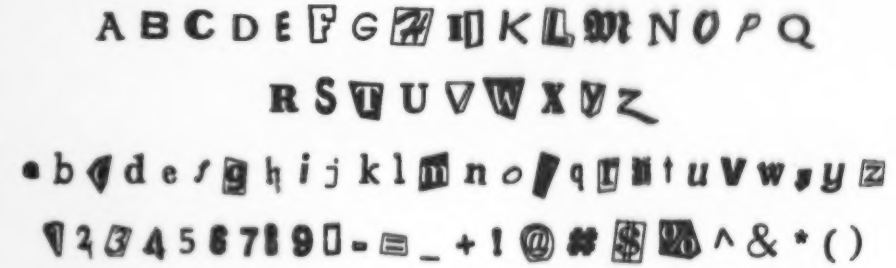
An example of Tekton regular typeface 16 pt. on 30 leading

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0 - = _ + ! @ # $ % ^ & * ( )

An example of Ransom Note regular typeface 16 pt. on 30 leading



In the design of fonts and typefaces, each character is given an amount of space at each side of the character. The set width is the width of the character and the space on either side and controls the amount of space between itself and the next character. The amount of space between characters can affect the legibility of the message.

Fonts can have either proportional or fixed spacing. With fixed spacing, all set-widths, regardless of the individual letter size, are the same or take up the same amount of space. Proportional spacing accommodates for the differences in letter sizes and reduces the spaces between them.

Justification refers to the spacing of words and letters so that each line of text starts (left aligned) or ends (right aligned) at the same point. Justification alters spacing between letters and words on the line, producing even margins on the left and on the right of the text.

This is an example of justified text. Both the left and right edges of the line of text are aligned.

9

This is an example of aligned right text. The right edge of the line of text is aligned.

This is an example of aligned left text. The left edge of the line of text is aligned.

Many computer programs allow the user to regulate spacing between words and letters by choosing the pitch associated with the font. The larger the pitch, the more space between letters. Another method of regulating this spacing is to modify printer commands which regulate spacing and kerning (the overlapping of certain letters on others in some fonts).

If the target audience for your document has good vision, or will be using a scanner or some other means to alter the format, standard point sizes of 10 to 12 will be acceptable. Otherwise, large print format should be provided. Letters that are too close together are difficult to read for partially sighted readers, especially those with central visual-field defects. Where possible, spacing should be wide between both letters and words. If your software and printer allow modification of spacing, add extra space between both. If your software does not allow modification of spacing, try using a wider spaced font.

This is an example of serif type.

This is an example of sans serif type.

Serifs are crosslines or finishing strokes on the letters in some typefaces. Common fonts which have serifs include: Times Roman, Bodoni, Garamond). Sans serif is a generic description of type without serifs. Common fonts which do not have serifs include: Helvetica and Vagabond).

This is a sample of Helvetica type 10 point type on 12 point leading

This is a sample of Helvetica type 12 point type on 14 point leading

Leading refers to the amount of white space between lines of type. Leading can be determined by your software program, or it may be modified by choosing points of leading (standard leading is usually one or two points for standard 10 point type). Increased leading usually makes a document more readable for a partially sighted individual.

Fixed-space fonts seem to be more legible for some readers than are proportional-spaced fonts. Leading should be increased over what is used in standard text because many partially-sighted people have particular difficulty finding the beginning of the next line while reading. The Research Department of the Lighthouse, Inc., recommends that leading should be 25 to 30 percent of the point size. Double spacing is more difficult to read and for scanners to use. For this reason, single spacing with increased leading should be used; however, leading size should not be increased to the size of a whole line space.

Standard typeface, using upper and lower case, is more readable than are some less frequently used styles, such as italic, slanted, small caps, or all caps. Complicated, decorative fonts should be avoided or reserved for emphasis in titles, or, as the Lighthouse suggests, for emphasis within Roman type. Bold versions of any typeface are thicker and provide more contrast, so they are usually more legible than their standard counterparts.

Fonts with familiar or easily recognized characters, such as Roman or sans serif, should be used, although letters and numbers with serifs are better for some partially sighted readers because they help define the character better. Right justification should be avoided; staggered right margins are easier to see and scan than uniform or block style right margins.

OTHER CONSIDERATIONS

Extra wide binding margins are helpful in bound materials because they help hold the volume flat, making it easier to use many magnification and other visual aids. Visual impairment can make distinguishing among similar documents difficult; therefore, when publishing a series of documents, each volume in a series should be identified with distinctive colors, formats, or sizes.

COSTS AND RESOURCES

With standard computer software and printers, there may be no additional costs to following these guidelines in house. However, using non–standard fonts often requires special print drivers that you install in your software that allow you to access the internal fonts. In many cases, an additional font cartridge may be required. Font software can range from fairly inexpensive shareware versions to expensive custom packages. If you choose to use shareware, BEWARE OF COMPUTER VIRUSES!

In order to become proficient at producing documents, become very familiar with your software and printer manuals. Do not hesitate to call the software or printer company to ask for clarification. Additionally, local computer software and hardware dealers can easily answer questions about what you need to do and how to use their products to complete your job.

Large Print Documents

ENLARGING PRINT

Most people with vision impairments both require and prefer type that is large. Large print documents should incorporate all suggestions for regular print regarding spacing, contrast, typeface, leading, etc.

Large print Large print Large print

The legal size for large print text is 14 point, but the Lighthouse Research Department (1991) recommends the use of at least 16 to 18 point size. The relationship between readability and point size is also dependent upon the typeface used. Standard fonts that can print in 16 or 18 point sizes are the most desirable, although scalable fonts allow you to choose any point size.

Remember, when creating a document that will be transferred into large print, the larger the font and spacing, the fewer lines of text that will fit on the page, so spacing may need to be adjusted. This should be anticipated so that, when a document is created, extra wide margins can be allowed. Otherwise, be prepared to spend some time reformatting your document.

A final option (**not recommended!**) is to use the enlarge feature on your photocopier. This can be tedious, because your original layout must be exact to copy uniformly; also, it may not produce the quality you desire. Another pitfall is that automatic photocopiers tend to select larger paper sized for enlarged copies, and most readers prefer standard 8 1/2" by 11" paper. Finally, this is the most expensive method in the long run when all expenses (i.e., copies, staff time, paper) are considered.

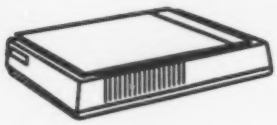
COSTS AND RESOURCES

Large print is probably one of the least expensive and easiest alternate formats to produce. The major expenses involved are the costs of font cartridges and software fonts where necessary. If your printing is done outside, costs will be higher for producing large print than standard print and for the extra paper that will be required.

Cost estimates and technical assistance may be obtained from local print/copy shops. Again, software and printer manuals are your primary source of information. Shareware font software may be available, but remain alert for possible computer virus contamination.

FORMATTING FOR SCANNERS

When distributing a document for use with scanners, the following should be kept in mind:



Scanner

- ☐ Keep the layout of every page the same-be particularly careful not to change column widths.
- ☐ Scanners do not recognize all possible fonts, so stick with a standard font (such as Times Roman or Helvetica.)
- ☐ Be sure that the hard copy is clear and on good quality paper; the better the copy being scanned, the better the result.
- ☐ Use a new ribbon for dot matrix printers, a new cartridge for laser or ink jet printers, and smudge free paper for all to contribute to clear, clean text.
- ☐ Do not send a document with broken or very light print letters (as often seen in faxed text, poor photographed text, or text from old printers/typewriters); the scanner has to guess the characters or words and will often make mistakes.

BRAILLE

Braille

Braille consists of arrangements of dots which make up letters of the alphabet, numbers, and punctuation marks. The basic Braille symbol is called the Braille cell and consists of six dots arranged in the formation of a rectangle, three dots high and two across.

Four common ways of producing Braille are:

- ☐ with a slate and stylus (comparable to writing);
- ☐ Braille writing machine (comparable to a typewriter);
- ☐ Braille embossing devices (comparable to a computer printer); and
- ☐ refreshable Braille display (unique to braille production – consists of 40 or 80 Braille cells that are capable of displaying a message that changes after each line is read).

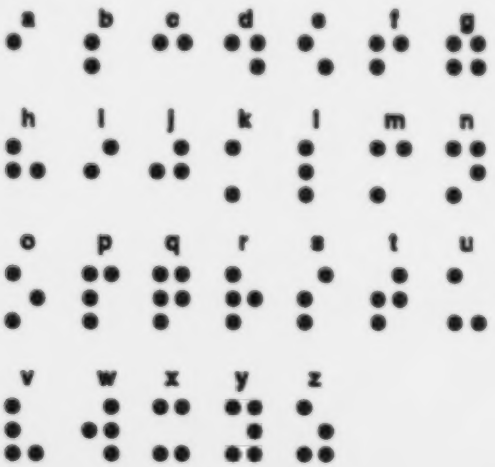
There are two grades of Braille:

- ☐ Grade 1 Braille (Braille symbols are used for each letter of the alphabet); and
- ☐ Grade 2 Braille (abbreviations are used to shorten the number of characters printed, as in shorthand).

If you are providing documents in Braille per individual request, it may be advisable to contact the individual to ascertain the grade desired.

The Library of Congress offers certification in Braille proofreading. An "A" Certificate qualifies an individual to make corrections in Braille transcriptions and to proofread for individuals, groups, or the Library of Congress. A "B" Certificate qualifies an individual to proofread only; corrections must be made by the Braillist.

There are a variety of ways to produce documents in Braille. Writing Braille with a slate and stylus compares to writing print with a pen or pencil. The stylus is used to push dots down through the paper, while the slate serves as a guide.



Braille Alphabet

A Braille writing machine is comparable to a typewriter. The keyboard has only six keys and a space bar. If the user pushes all six keys at one time, six dots are raised on the paper in the formation of a Braille cell. Therefore, various combinations of keys produce various letters.

Putting long documents into Braille is usually not recommended. Braille consists of 42 characters per line and is written on heavy paper in raised dots; this format prevents pages from lying together and produces an unweildy document if the text is lengthy. Documents such as these should be provided on diskette when possible.

Braille embossing devices are available that may be attached to computers instead of or in addition to regular printers. There are a variety of Braille translation programs that convert text to Braille. Some programs require that text be entered into their included word processing program. Other more recent

programs allow the user to import text from various word processing programs for translation into Braille. Other systems combine page scanners with Braille translation programs to allow one to scan in text from any source and to print it out in Braille. Some Braille readers use a refreshable Braille display to provide information in a Braille format from a computer text file. There are also "dedicated" devices such as the Braille 'n Speak that allow a user to print out stored information by directly attaching a Braille embosser to the device.

COSTS AND RESOURCES

If a program is interested in setting up Braille production capabilities, there are several items that will be needed. Obviously, one of the easiest ways to produce documents is through the use of a computer. Therefore, a computer with a word processing program such as WordPerfect® or Appleworks® may be needed. Another item that may be needed to translate the regular print information from the word processing program into Braille will be a Braille translation program such as Duxberry for WordPerfect® or BEX 3.1 for Apple IIe, IIc, or IIGS. It is important to contact producers of these programs prior to purchase so that compatibility of programs is assured. Some Braille translation programs have built-in word processing capabilities. A Braille printer or embosser will be necessary to actually produce the Braille document. These range in price from $1,800 to $12,000 depending upon the features and durability desired.

It is important to determine the volume and frequency at which Braille documents will need to be produced. This will dictate the durability requirements of the equipment that will be purchased.

If your program will only occasionally need to produce documents in Braille, it may be best to find an outside resource to produce Braille copies. There are several ways to find these resources. You may want to start locally with your state's Commission for the Blind. Every state has an agency that serves blind individuals. It may be part of your Vocational Rehabilitation Agency, part of another agency such as the Department of Education, or your state may have a completely separate agency serving blind individuals. These agencies will often offer to produce your documents in Braille on a fee for service basis.

Other national resources that can put you in contact with this service may include:

- ☐ National Library for the Blind and Physically Handicapped,
- ☐ American Foundation for the Blind, or
- ☐ National Federation of the Blind.

AUDIO TAPE

Although it is generally better to seek a professional, outside provider rather than attempting to produce tapes in-house, the cost of professional recording is prohibitive for most organizations. Additionally, such services are often difficult to locate and procure. High quality recording equipment is required to produce a high quality master tape suitable for duplicating; such equipment is available at reasonable cost. Find a staff member who has a clear voice to record a master tape, which may be duplicated in-house. Always be certain to produce tapes from the master and not from a copy.

There are many guidelines that apply to audio taping text. These may be obtained from the National Library for the Blind and Physically Handicapped (Technical Standard #3, December 1983). Following are some of these guidelines.

TEAM MEMBERS FOR RECORDING AUDIO TAPES

- ❒ **Narrator:** The individual who presents the written material through his/her voice.
- ❒ **Monitor:** The person who operates the recording equipment during a recording session and follows along with the narrator in a second copy of the text. The monitor maintains quality during the recording session.
- ❒ **Reviewer:** This person proofs the completed recording against the print copy. The reviewer should have nothing to do with the narration or monitoring of the material being reviewed.

Information Included in Beginning Announcements of Audio Tapes

- ❒ Number of sides
- ❒ Sides in consecutive order
- ❒ Title
- ❒ Author(s)
- ❒ Copyright
- ❒ Narrator's name
- ❒ Tone indexing
- ❒ Number of pages in document
- ❒ Other information from the cover
- ❒ Introductory information
- ❒ Table of contents
- ❒ Text

COSTS AND RESOURCES

A number of recorders are available for around $100.00 which record and play Library of Congress formatted four-track cassettes.

ELECTRONIC TRANSFER

Computer with modem

Electronic transmission allows rapid transfer and reformatting of files. In order to transfer electronically, both the sender and the receiver must have access to a computer, a modem (plugged into a phone jack), and communication software. Additionally, it is necessary to know the parameters of the computer to which you are sending so that the computers can communicate.

Files must be in a format that can be read by the receiving computer. In most cases, ASCII format is the best. Many "fancier" format commands and tabs/indents can be lost or modified, and graphs and figures may be lost when sending information electronically, depending upon the communication software used. Therefore, it may be desirable to keep the format as simple as possible. One potential problem with electronic transfer is that the document may look perfect to the sender, but it may be garbled to the receiver, who has to expend a lot of effort to reformat the document.

Prior to transferring a document, be sure to check with the receiver for the proper modem/transfer settings. If you are a novice at electronic file transfer, this method should only be used if the receiver requests it and can talk you through it. Otherwise, sending a diskette through the mail is much easier, just a bit slower.

If you desire to send a document to many users at once, an electronic bulletin board service (BBS) may be used. Simply follow the guidelines established by the BBS for uploading or downloading. Every BBS has a SYSOP (Systems Operator) available for technical assistance.

If you have the necessary hardware and software and are sending files locally (as opposed to long distance), this can be the most inexpensive method of providing "custom" alternate format material. Information transferred electronically or supplied on diskette may be translated by consumers to their preferred format if they have the proper equipment available. It is probably not cost-efficient to purchase modems and communication software solely for the purpose of provision of alternative formats. If long distance telephone charges are a factor, it may be cheaper to mail a diskette. Additionally, consideration should be given to the amount of time the receiver must spend cleaning up the document upon receipt.

COSTS AND RESOURCES

Resources include local computer sales personnel and local College and University personnel, who may be able to get you an account for Internet services. The Internet is a free national communication service that incorporates thousands of academic and government institutions. However, you should be aware that if you access the Internet through a third party (such as

Compuserve, Prodigy, or America On-Line) you will incur long distance telephone line charges. There are many simplified manuals available, such as *Internet for Dummies.*

In addition to Internet, services such as Compuserve and Prodigy are available on a fee-for-service basis. Subscribers to these services may transfer information through Compuserve/Prodigy as well as through Internet.

DISKETTES

Sending information on diskette is very easy and cost efficient. Sending the appropriate size and density diskette is important; be sure to ask if the receiver needs low or high density, 5 1/4" or 3 1/2" diskettes. Additionally, if one machine is IBM compatible and the other machine is an Apple, specialized software may be needed to allow one machine to communicate with the other. Be certain that compatibility is not an issue by determining what equipment and software the receiver has available. As with electronic transfer, ASCII text format is the safest possible format; however, if you use the same specific word processing package as the receiver of the information, you may want to send the file in that format.

COSTS AND RESOURCES

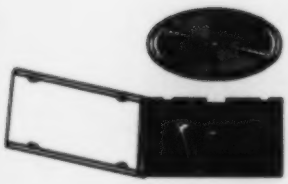
Data on diskette may be used in any of a number of ways. Text may be read on screen readers; it may be translated into Braille; it may be used to produce hard print; or it may be converted from text to speech, depending upon the resources of the receiver. If you want the users of your information to return your diskettes, be sure to leave a note requesting that they do so. Once the information has been downloaded, the diskettes may be returned to the originator, adding to the cost effectiveness of this method.

CD-ROM

CD-ROM (Compact Disc – Read Only Memory) provides a format that can hold tremendous amounts of information. As the name clearly states, information on a CD-ROM can be accessed and read, but cannot be edited or altered in any way. CD-ROM is a revolutionary way to store information due to its compactness. A single disc can store as much text, image, and sound information as 500 high density floppy disks. An entire volume of encyclopedias can reside on a CD, with the added enhancement of sound (e.g., an article on music may include a picture of an ancient musical instrument and a few musical notes produced by the instrument). Additionally, information on CD may be accessed rapidly by supplying search criteria; this is much faster than looking for key words in an index, selecting the appropriate volume, and seeking desired information alphabetically. With CD-ROM, the computer does all of the work. While it is not currently possible for most organizations to produce their own materials in CD-ROM format, this section is included due to the utility of CD technology for persons with disabilities.

Individuals with varying disabilities may find CD-ROM to be extremely useful. CD's offer all of the advantages of regular diskettes with respect to information retrieval in various formats (e.g., braille, large print, etc.), but with the added advantages of sound, quick information retrieval, and increased volume of information.

The CD-ROM Advantage for Blind Users (Croft, Kendrick, and Gayzagian, 1994) states that any person desiring to use CD-ROM technology should have at least a 386 computer with 4 (preferably 8) megabytes of RAM in order to fully utilize the features of CD-ROM, although some users have successfully utilized many CD programs with 286 computers and as little as 1 megabyte of RAM. However, as CD systems become more sophisticated, more memory and more speed will be required to achieve maximum utility of this medium.



Speed is also a factor, and there are two kinds of speed to consider: average access time, and data transfer rate. The National Braille Press suggests that a double speed data transfer rate is the least that should be considered; triple speed may be worth the additional money, but quadruple speed probably does not justify the additional cost.

Unlike other media, CD-ROM products offer blind, low-vision, and hearing impaired individuals the opportunity to browse through publications, reference materials, etc. This affords the opportunity to read for pleasure and to passively "discover" information in addition to looking for specific information for specific purposes.

The National Braille Press, Inc. admonishes potential users to keep the following in mind concerning accessibility of CD's.

(1) Accessibility is a relative term; some discs work better with speech than with braille, and some parts of discs may be accessible while other parts are not (e.g., text may be accessible but pictures will not for blind users).

(2) Hardware compatibility is an issue. Some screen reading programs work better than others; some discs require windows, while others work only with DOS.

(3) Titles are often updated, and the newer versions may not be accessible.

COSTS AND RESOURCES

CD-ROM drives are available as external or internal drives. While external drives are slightly more expensive, they may be moved from one machine to another, provided the proper cords and interfaces are present. CD-ROM drives are available from $200 to as much as $1000, depending upon speed and presence or absence of a sound card (which will have to be purchased separately if it is not included). As far as the CD's themselves, prices range from $10 through $500 and more, but prices vary widely, so it is a good idea to shop around.

Not all CD-ROM titles are accessible; for example, CD's that are largely graphic contain pictures that cannot be read by a Braille 'n Speak. Text should

be stored in ASCII format as opposed to graphics format to ensure compatibility and maximum utility for the blind or low vision individual. Many CD's are available that may be launched with keystrokes, eliminating the need for pointing and clicking with a mouse. For assistance in choosing accessible CD's, contact a company that is knowledgeable in the area of accessibility. You may have to pay more for products purchased through such companies, but there is the added advantage of support, and their return policies are generally more liberal than catalog dealers. Some companies recommended by the National Braille Press, Inc. include Raised Dot Computing, Adaptive Technologies, Personal Data Systems, and Ferguson Enterprises. Sources of information about accessible CD-ROM products include the International Braille and Technology Center, the Trace Research and Development Center, and the CD-ROM forum on CompuServe.

Broadcast Media and Captioning

If video or television is used in a presentation, you should provide captioning or a typed transcript as an alternate format for people who are deaf or hard of hearing. We have all experienced captioning in the form of subtitles if we have gone to a foreign film; captions are lines of dialogue printed at the bottom of the screen during a program which provide a translation of the dialogue from one that is not understandable to one that is understandable.

Most deaf users prefer captions to transcripts. Captions are prepared according to certain conventions that enhance the legibility of the captions. The rate of presentation is controlled, with an average of 120 to 140 words presented per minute. They are presented to the extent possible in synchrony with the speaker.

Captioning can be done post-production or live. Post-production captioning is utilized when presenting through videotape or through television broadcast. This captioning is placed on the videotape or sent out on the broadcast signal after the program is complete and in its final form. If you plan to produce a videotape or a broadcast, remember to set up camera angles that leave space at the bottom of the screen where the captions will appear.

For post-production captioning, the captions can be:

(1) open, on the screen for all to see (like subtitles or emergency broadcasts), or

(2) closed, visible only through the use of a decoder (closed captions are broadcast on line 21 of the broadcast signal).

If your presentation is live, real-time captioning is used. Real-time captioning is the instantaneous translation of audio into captions while the material is being presented. This is accomplished by a person trained in the use of a stenotype machine (as used in courtrooms) to produce a shorthand data file which is translated by computer to English text and displayed on a closed circuit or regular television (if done in conjunction with a production crew), or on a screen using an overhead projector with a computer interface.

This type of captioning can be difficult to follow if unusual or unfamiliar terms or names are used since the typist must use a phonetic approximation if he/she is uncertain. However, real-time captioning is now a popular method for use at conferences, conventions, or other live events either in conjunction with or instead of an interpreter.

COSTS AND RESOURCES

The easiest and least expensive method is to provide a verbatim, typed transcript. However, few users like this method. Using sign interpreters is encouraged at group presentations, but remember that not all deaf people know sign language. It is always a good idea to provide handouts for people to follow along and to use flip charts and other visual materials. Never attempt to speak without a public address system.

There are several detached decoders available ranging from $150 to $850. These decoders generate characters from the data broadcast on line 21 and display the characters as white on black captions on the television screen. The Television Decoder Circuitry Act of 1990 requires that all televisions manufactured or imported after July 1, 1993, have built-in decoding capacity in all sets larger than 13 inches.

Captioning services may be purchased or you can add captions to your own videos. Post production captioning is an expensive process; captioning of a 30 minute program can take from 8 to 16 hours of work. Captioning services cost roughly $1,000 to $2,000 per hour according to 1991 estimates. Cost is dependent upon the vendor, the program length, and the program type.

To do your own captions, a number of systems are available. The Line 21 encoder, produced by EEG, Inc. accepts video plus caption data as input and provides output in the form of video with data inserted on line 21. These cost approximately $6,000.

A PC based teleprompter from Computer Prompting Corporation, Inc. includes an option for automatically feeding the scrolled script into a Line 21 encoder. Various versions cost $4,000 to $6,500 without the Line 21 encoder.

Some new software is available to produce captions on videotapes for schools and other organizations. This software sells for approximately $1,000 and requires a special decoder that sells for $1,500. Also needed are a DOS based computer, two VCR's, and a television monitor. If you already have the VCR's and computer, you can set up the system for $2,500.

Several systems are on the market for real-time captioning, ranging in price (1994 estimates) from $3,995 and up, including:

- ❒ Xscribe Captioning System of Xscribe Corporation;
- ❒ Digitext System of Captioning Concept, Inc.; and
- ❒ RapidText System of RapidText, Inc.

Real-time captioning services may be purchased for $40 per hour (1994 price estimate).

Presentations

When making group presentations, provide crisp, clear slides and overheads with minimal information on each. Completely detail the information on visuals for partially sighted members of your audience. Additionally, provide handouts of your slides and presentation materials to allow those who rely on close vision or vision aids to easily follow the presentation or to scan it at a later time.

Lighting must be considered when presenting materials on overheads or slides. Lowering room lights improves the legibility of overheads, but individuals with low vision may not be able to see their handouts or to take notes. Portable lighting should be made available in these cases.

RESOURCES

The key word in provision of alternate format materials is preparation. It is not necessary for those with a limited budget to prepare all materials in five different formats up front; it may be sufficient to produce and supply alternate formats only upon request. However, be certain that you make consumers aware that you are providing alternate formats; otherwise, they may not know to request them.

Here is a suggested "Alternate Formats Order Form."

CUT HERE ✂

Mailing List and Alternate Format Request Form

Name: _____

Title: _____

Address: _____

Phone: _____

Please Check Appropriate Format

❑ **No Special Format Needed; Please Put on Mailing List**

Computer Diskettes

___ High Density
___ Low Density
___ 5-1/4"
___ 3-1/2"

Text Format

___ ASCII
___ WordPerfect
___ Macintosh® Text File

___ **Braille**

___ **Large Print**

___ **Audio Cassette**

Additional Comments:

_____
_____
_____
_____
_____

Following is a list of potential resources for the production of materials in alternate formats.

ON-SCREEN VIEWING

A number of large print programs for on-screen viewing are available. Some examples include:

LPDOS (and DELUXE) – magnifies up to 16 times standard size – for IBM/DOS environments; approximate price $650.00

BIG – memory resident display enlargement designed to work with WordPerfect 5.1 and earlier and LetterPerfect 1.0 in DOS environments – a color graphics card is required – approximate price $39.00

INFOCUS – memory resident for DOS environments – requires a VGA graphics card – approximate price $149.00

ZOOMTEXT – memory resident for DOS environments – enlarges up to 8 times standard – approximate price $495.00 – $595.00

CLOSEVIEW – provides magnification 2 to 16 times larger than standard print – for MAC plus, SE, II, IIx, IIxc, IIci – allows reverse screen viewing (black background with white foreground) – sold as packages with operating disks

EYERELIEF – a stand alone word processing software program for DOS environments – cannot be used with other software but documents created or read in EYERELIEF can be saved in ASCII format to transfer to other software programs – magnifies 1 to 5 times standard size – requires at least 512K RAM and a graphics card – approximate price $295.00.

Additionally, specialized speech synthesis software is available from vendors listed on the following pages.

Resource Listings

This listing provides names, addresses, and telephone numbers of vendors and organizations that may be able to provide technical assistance.

Audio Taping

Independent Living Aids Inc.
27 East Mall
Plainview, NY 11803
(516) 752-8080
(800) 537-2118

LS&S Group
P.O. Box 673
Northbrook, IL 60065
(312) 498-9777
(800) 468-4789

Braille Production

Arkenstone
1390 Borregas Avenue
Sunnyvale, CA 94089
(800) 444-4443

Blazie Engineering
105 E. Jarrettsville Road
Forest Hill, MD 21050
(410) 893-9333

Human Ware, Inc.
6245 King Road
Loomis, CA 95650

Raised Dot Computing
408 South Baldwin
Madison, WI 53703
(608) 257-9595

Telesensory
455 N. Bernardo Avenue
PO Box 7455
Mountain View, CA 94039-7455
(415) 960-0920

Businesses Offering Support with Assistive Technology and CD-ROM

Adaptive Technologies
3862 N. Renn Avenue
Fresno, CA 93727
(209) 291-3645

National Braille Press
88 St. Stephen Street
Boston, MA 02115
(617) 266-6160

Ferguson Enterprises
RRI
Box 238
Manchester, SC 57353
(605) 546-2366

International Braille and Technology Center for the Blind
1800 Johnson Street
Baltimore, MD 21230
(410) 659-9317

National Braille Press, Inc.
88 St. Stephen St.
Boston, MA 02115

Personnel Data Systems, Inc.
P.O. Box 1008
Campbell, CA 95009
(408) 866-1126

Raised Dot Computing
408 S. Baldwin Street
Madison, WI 53703
1-800-347-9594

Trace Research and Development Center
University of Wisconsin-Madison
S-151 Waisman Center
1500 Highland Ave.
Madison, WI 53705
(608) 263-2309

Captioning Services

Caption Center of WGBH
125 Western Avenue
Boston, MA 02134
(617) 492-9225 (Voice/TDD)

Computer Prompting Corporation
3408 Wisconsin Avenue, NW
Washington, DC 20016
(202) 966-0980

Gallaudet University
800 Florida Avenue, N.E.
Washington, DC 20002

National Captioning Institute
5203 Leesburg Pike,
Suite 1500
Falls Church, VA 22041
(703) 998-2400 (Voice/TDD)

Real-Time Captioning, Inc.
7101 Sepulveda Boulevard
Van Nuys, CA 91405

Cognitive Solutions

Aldus Corporation
Consumer Division
5120 Shoreham Place
San Diego, CA 92122
(619) 558-6000

Baseline Publishing
1760 Moriah Woods
Suite #5
Memphis, TN 38117
(901) 682-9676

Don Johnston, Inc.
PO Box 639
1000 N. Rand Road
Wauconda, IL 60084
(800) 999-4660

EPIE Institute
103-3 W. Montauk Highway
Hampton Bays, NY 11946
(516) 728-9100

Information About Alternate Formats

American Printing House for the Blind, Inc.
1839 Frankfort Avenue
Louisville, KY 40206-0085
(800) 233-1839
(502) 895-2405

Library Reproduction Service
1977 S. Los Angeles Street
Los Angeles, CA 90011-1096
(800) 255-5002
(213) 749-2463

Info-Line
American Society for Training and Development
1640 King Street
Box 1443
Alexandria, VA 22313-2043

National Braille Press
88 St. Stephen Street
Boston, MA 02115
(617) 266-6160

National Federation of the Blind
1800 Johnson Street
Baltimore, MD 21230-4998
(800) 638-7518
(410) 659-9314

National Library Service for the Blind and Physically Handicapped
Library of Congress
1291 Taylor street, NW
Washington, DC 20542
(800) 424-8567
(202) 707-5100

Recording for the Blind, Inc.
20 Rozel Road
Princeton, NJ 08540
(800) 221-4792
(609) 452-0606

On-Line Forums

CompuServe
Enter "go cdrom"

Print Guidelines

The Lighthouse, Inc.
800 Second Avenue
New York, NY 10017
(212) 808-0077

Journal of Visual Impairment and Blindness
Special Issue on Low Vision
1992, January, Volume 86, Number 1

National Federation for the Blind
1800 Johnson Street
Baltimore, MD 21230-4998
(800) 638-7518

Speech Synthesis Software

Berkeley Systems
2095 Rose Street
Berkeley, CA 94709
(510) 540-5535

REFERENCES

Darraugh, B. (Ed.). (April, 1992). *The Americans with Disabilities Act: Techniques for Accommodation.* Info-Line. Alexandria, VA: American Society for Training and Development.

Library of Congress. (1983). *Technical Standard #3:* Recording of Books and Magazines for Tape Mastering in Multistate Centers Regional Libraries Subregional Libraries. Washington, DC.: Author.

Lighthouse News (Fall, 1991) New York, NY: The Lighthouse, Inc.

Craft, D., Kendrick, D., and Gayzagian, A. (1994). *The CD-ROM Advantage for Blind Users.* Boston: National Braille Press, Inc.